REMARKS/ARGUMENTS

STATUS OF CLAIMS

Applicant has amended Claims 28 and 87. Applicant respectfully submits that the specification of the current application supports the proposed amendments to Claims 28 and 87 with at least paragraphs [0081], [0083], [0085], [0086], [0089], and [0091]. Applicant's representative thanks Examiner Dwivedi for the telephone interview today in which the amendments to Claims 28 and 87 were discussed.

Applicant has also cancelled Claims 29-31, and thus, the rejections of Claims 29-31 are moot. Applicant respectfully requests reconsideration and allowance of amended Claims 28 and 87 in light of the following remarks.

CLAIM REJECTIONS – 35 U.S.C. §102

Independent Claims 28 and 87

Claims 28 and 87 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over United States Patent No. 4,767,280 issued to Markuson et al. (hereinafter "Markuson") in view of United States Patent No. 6,481,973 issued to Struthers ("Struthers") and United States Patent No. 6,227,808 issued to McDonough ("McDonough").

Amended Claim 28 specifies "automatically reducing at least one of an output voltage provided to the motor and an operating frequency of the motor if the AC line current is greater than the programmed threshold in order to drive the motor in a limp mode in an attempt to clear the foreign object obstruction; and automatically shutting down the motor within up to about 30 seconds if the motor does not operate within operational limits while being driven in the limp mode and the foreign object obstruction cannot be cleared."

Amended Claim 87 specifies "executing an automatic recovery operation if the parameter is outside of the range of programmed thresholds in an attempt to clear the foreign object obstruction, the automatic recovery operation including at least one of generating an updated

speed control command, driving the motor in a limp mode, shutting down the motor for up to about 30 seconds and then restarting the motor, and operating the motor in a reverse direction for up to about 30 seconds and then operating the motor in a forward direction; and automatically shutting down the motor within up to about 30 seconds if the recovery operation fails and the foreign object obstruction cannot be cleared."

Markuson teaches a controller 10 that monitors power consumption of a pump motor 2 for use in pumping petroleum from beneath the surface of the earth. The controller 10 of Markuson provides indications of operating conditions for the pump motor 2. The controller 10 can also measure other conditions, such as flow and temperature. When the controller 10 detects an overload or an underload condition, the controller 10 switches an appropriate indicator light on and starts a timer. Markuson teaches that service personnel must then manually react to the indicator light before the pump becomes stuck and the motor is forced to shut down. Markuson also teaches using the controller 10 to control the operation of the pump motor 2 based on input from a demand limit control system of a power company. *Markuson*, Abstract; col. 4, lines 4-7; col. 5, lines 3-11; col. 5, lines 33-53; col. 6, lines 37-41; col. 6, line 59 to col. 7, line 44. However, Markuson does not teach or suggest reducing the output voltage to the pump motor 2 or reducing the operating frequency of the pump motor 2 when the controller 10 detects an overload or an underload condition. Rather, Markuson teaches that a human being must see an indicator light and react before the pump gets stuck and the motor is "killed." Thus, Markuson does not teach automatically reducing an output voltage or operating frequency to run the motor in a limp mode or automatically shutting down the motor within up to about 30 seconds if the pump motor 2 does not operate within operational limits while being driven in the limp mode, as specified by amended Claim 28.

With respect to Claim 87, Markuson does not teach or suggest executing an automatic recovery operation when the controller 10 detects an overload or an underload condition. More specifically, Markuson does not teach executing an automatic recovery operation and automatically shutting down the pump motor 2 within up to about 30 seconds if the automatic recovery operation fails, as specified by amended Claim 87.

Struthers does not cure the deficiencies of Markuson. Struthers teaches a method of operating a variable speed pump 54 for emptying drainage sumps in a residential basement. The pump 54 of Struthers uses sensors 42 and a controller 22 to monitor the speed and torque of a motor 12. The controller 22 can determine that the pump 54 is clogged "by detecting that the motor 12 is developing an unacceptably high torque." *Struthers*, col. 8, lines 1-2. If the controller 22 determines that the pump 54 is clogged, Struthers teaches that the pump unit 10 will perform a series of steps (steps 126-152, as shown in Figure 5B of Struthers) to unclog the pump 54. First, the motor speed is shifted down (step 134) until it reaches its lowest speed (step 142). Once it reaches its lowest speed, the motor 12 performs a series of three backwards-forwards jogs (steps 144-146). The final steps include running the motor 12 at the highest speed possible (step 148) until either the tank 84 is dry (step 150) or until five minutes has expired (step 152). Only after the tank 84 is dry or five minutes has expired will the pump 54 be turned off (steps 154, 125). *Struthers*, col. 3, lines 1-47; col. 5, lines 18-30; col. 7, line 60 to col. 8, line 2; Fig. 2; and Fig. 5B. While Struthers teaches initially reducing the speed of the motor 12, Struthers does not teach automatically shutting down the motor 12 within up to about 30 seconds if the motor 12 does not operate within operational limits while being operated at the reduced speed, as specified by amended Claim 28.

Similarly, Struthers does not teach automatically shutting down the motor within up to about 30 seconds if an automatic recovery operation fails, as specified by amended Claim 87. Struthers also does not teach an automatic recovery operation of shutting down the motor 12 for up to about 30 seconds and then restarting the motor 12. In addition, Struthers does not teach an automatic recovery operation of operating the motor in a reverse direction for up to about 30 seconds and then operating the motor in a forward direction. Rather, Struthers only teaches performing "a sequence of short bursts of forward and/or reverse motor power." In summary, Struthers ultimately only teaches taking at least five minutes to shut down the motor 12 when an unacceptably high torque is detected. In contrast, the subject matter of Applicant's amended Claims 28 and 87 results in the motor being shut down within up to about 30 seconds in order to help prevent bodily harm as a result of a foreign object obstruction in a pool or spa system.

McDonough does not cure the deficiencies of Struthers and Markuson. McDonough teaches a control circuit 26 for use with a pump 20 for a spa system. The control circuit 26 includes a pressure sensor 70 to monitor pressure at the input side of the pump. The control circuit 26 also includes an on/off switch 40 which can be activated by a user to turn the pump 20 on. Once the pump 20 is turned on, a baseline pressure is acquired. If, during operation, a decrease or increase in pressure from the baseline pressure occurs, the pump 20 immediately shuts off. *McDonough*, Abstract; col. 3, lines 51-52; col. 4, lines 17-22; col. 7, lines 11-15; col. 7, lines 43-50. Therefore, McDonough does not teach reducing an output voltage or operating frequency to run the motor of the pump 20 in a limp mode or automatically shutting down the motor of the pump 20 within up to about 30 seconds if the motor of the pump 20 does not operate within operational limits while being driven in the limp mode, as specified by amended Claim 28.

Similarly, McDonough does not teach executing an automatic recovery operation or automatically shutting down the motor within up to about 30 seconds if the automatic recovery operation fails, as specified by amended Claim 87. In addition, McDonough does not determine if the pressure is outside of a range of "programmed thresholds," as specified by amended Claim 87. Rather, McDonough acquires a new baseline pressure each time the pump is turned on, resulting in a constantly-changing pressure threshold.

With respect to the combination of the cited references, McDonough teaches away from the subject matter of Claims 28 and 87 and from the teachings of Struthers. McDonough teaches immediately shutting off the motor of the pump 20 after sensing a pressure above or below the baseline pressure. Immediately shutting down the motor of the pump as taught by McDonough will result in frequent, and often false, shutdowns of the motor. Also, the operation taught by McDonough is not suitable for combination with the operation taught by Struthers, because Struthers teaches shutting down the pump only after at least five minutes has expired. As a result, Struthers and McDonough cannot be combined to arrive at the subject matter of Claims 28 and 87, because the intended function of each reference would be destroyed by such a combination. In addition, neither Markuson's nor McDonough's methods teach or suggest

operating a motor in an attempt to clear a foreign object obstruction, as specified by Claims 28 and 87. Moreover, neither Markuson nor Struthers contemplates a foreign object obstruction in a pool or spa system, as specified by Claims 28 and 87.

In light of the arguments set forth above, Applicant respectfully submits that independent Claims 28 and 87 are allowable.

CONCLUSION

Applicant respectfully requests reconsideration and allowance of pending Claims 28 and 87.

Respectfully submitted,

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Docket No. 105196.012000
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